DOCUMENT RESUME

ED 370 518 HE 027 479

AUTHOR	Flores, Antonio
TITLE	Early Awareness Strategies and Their Measurement: Use of Hierarchical Loglinear Analysis To Assess the Effects of Michigan's Project Awareness on Middle School Students.
INSTITUTION	Michigan Higher Education Assistance Authority, Lansing.
PUB DATE	10 Jul 93
NOTE	23p.; Paper presented at the Annual Conference of the National Association of Student Financial Aid Administrators (San Diego, CA, July 7-10, 1993).
PUB TYPE	Speeches/Conference Papers (150) -- Information Analyses (070)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Academic Aspiration; College Attendance; College Bound Students; Data Analysis; *Early Intervention; Evaluation Methods; Higher Education; Information Dissemination; Intermediate Grades; Junior High Schools; Junior High School Students; *Knowledge Level; Measurement Objectives; Measurement Techniques; Middle Schools; *Parent Education; Paying for College; Pilot Projects; Program Evaluation; State Programs; *Student Attitudes; *Student Financial Aid
IDENTIFIERS	*Middle School Students; *Project Awareness MI

ABSTRACT

This paper reviews and critiques empirical evidence concerning knowledge gaps and misconceptions among secondary school students, parents/guardians, and educators about postsecondary education and student financial assistance opportunities and prerequisites, in particular, how Michigan's middle school based Project Awareness may affect student aspiration. Project Awareness consists of five interventions for transmitting messages to students and to their parents through curriculum guides, TV videos, a database on financial aid resources, career clubs, and newsletters. With a focus on Project Awareness, the paper addresses early awareness as a research and policy issue, describes measurement and evaluation approaches and techniques for the study of early awareness, and shares some preliminary data analysis based on pilot evaluation results. The first section of the paper looks at early awareness as a policy issue and discusses the theoretical and empirical bases for the Project, related policy perspectives, anticipated research challenges and opportunities, and the information dissemination strategies planned for pilot-testing. The second section offers evaluation and preliminary analysis and reviews the approaches and techniques for project evaluation, sampling, instrument development, the variables under consideration, and analyzes preliminary data from pilot evaluation activities. (Contains 23 references.) (JB)

ED 370 518

Early Awareness Strategies and Their Measurement: Use of Hierarchical Loglinear Analysis to Assess the Effects of Michigan's Project Awareness on Middle School Students

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Antonio Flores

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Antonio Flores, Ph.D.
Director of Support Services Programs

Michigan Higher Education Assistance Authority
P.O. Box 30008
Lansing, Michigan
(517) 373-0457
FAX (517) 335-6851

For Presentation at the
Annual Conference of the
National Association of Student Financial Aid Administrators
San Diego, California
July 7-10, 1993

BEST COPY AVAILABLE

CONTENTS

INTRODUCTION 1

EARLY AWARENESS AS A RESEARCH AND POLICY ISSUE 2
- Theoretical and Empirical Basis 2
  - Cognitive Dimensions 2
  - Motivation and Affect 3
- Policy Perspectives 4
  - Job Outlook 4
  - College Attendance Costs and Aid 6
  - Early Awareness 6
- Strategies to Be Pilot-Tested 6
  - Curriculum Guides 7
  - TV Videos 7
  - Database on Financial Aid Resources 7
  - Career Clubs 8
  - Newsletters 8
- Research Challenges and Opportunities 9

EVALUATION AND DATA ANALYSES 11
- Measurement and Evaluation Considerations 11
  - Data and Preliminary Analyses 12
  - Operationalization of the Analytic Variables 13
  - Interpretation of the Findings 16

REFERENCES 18

APPENDIX 20

TABLES

Table 1 Projected Percent Change in the Employment Growth of Select Occupational Groups: 1990-2005 5

Table 2 Employment Projections of Select Occupations in Michigan: 1988-2000 5

Table 3 Strategies Selected by Project Schools 9

INTRODUCTION

This paper reviews and critiques empirical evidence concerning knowledge gaps and misconceptions among secondary-school students, parents/guardians, and educators about postsecondary education and student financial assistance opportunities and prerequisites. It also discusses contextual variables impacting on students' access to information and support systems for seeking postsecondary education and financial aid opportunities, as well as the relevance of cognition, motivation, and diffusion theories to information dissemination strategies. In addition, it analyzes hierarchical loglinear models as the preferred research strategy for the evaluation of information dissemination strategies and their impacts on students, parents, and educators targeted for participation in Michigan's Project Awareness.

This preliminary paper on Project Awareness addresses early awareness as a research and policy issue, describes measurement and evaluation approaches and techniques for the study of early awareness, and shares some preliminary data analyses based on pilot evaluation results. By definition, therefore, this is an inconclusive, but important review of substantive and methodological issues surrounding the development and implementation of Project Awareness. In that sense, it could be deemed as a first step in the project's formative evaluation process.

The paper is divided into two major sections: (1) Early Awareness as a Research and Policy Issue and (2) Evaluation and Preliminary Analyses. The former deals with the theoretical and empirical bases for Project Awareness, related policy perspectives, anticipated research challenges and opportunities, and with the information dissemination strategies planned for pilot-testing. The second part reviews the approaches and techniques for project evaluation, sampling, instrument development, and the variables under consideration, and analyzes preliminary data from pilot evaluation activities.

EARLY AWARENESS AS A RESEARCH AND POLICY ISSUE

> Elementary and secondary students are woefully underinformed about the costs of college, the availability of student aid, the job market, or the economic gains of college attendance.[1]

This national phenomenon is further corroborated at the state level in Michigan. Four consecutive statewide annual surveys with high-school students, which were conducted each fall from 1986 to 1989, document persistent patterns of unfamiliarity, and even ignorance, on the students' part about postsecondary education in general and student financial aid in particular. In the most recent survey, for example, over two-thirds of the respondents were not aware of student financial assistance and one-third of those in their senior year had not inquired into the availability of aid as late as December of that year (Project Outreach, 1989, 29). Thus, lack of awareness about postsecondary training requirements for the new jobs emerging in our post-industrial economy and about resources available to finance a postsecondary education remains a major policy issue.

As a research topic, early awareness presents a series of challenges and opportunities for creative and innovative work. The complexity of the context in which today's youth acquire new information and are motivated to use it for career exploration purposes, along with the difficulties encountered in the dissemination and application of new information in large scale, trigger a number of conceptualization, operationalization, and methodological questions which must be coherently addressed through a multilevel model which aims for parsimony and completeness.

Theoretical and Empirical Basis

A cursory review of related literature suggests that early awareness concerning postsecondary education and student financial aid opportunities and prerequisites may be conceived as a multidimensional construct which includes cognitive, motivational, and orientational factors at the individual level, as well as contextual organizational variables at the neighborhood or community, school, and classroom levels.

Cognitive Dimensions

In The Teenage World, Offer et al. (1988) report that universal adolescents are attuned to cognitive mastery, showing ability to reflect, reason, and think critically on new intellectual levels. In this regard, Graham and Golan (1991, 187) conclude that "task-involving states are those in which one's goal is to master a task: Greater acquisition of new skills is considered an end in itself. This is contrasted with ego-involving states in which one's primary goal is to demonstrate high ability relative to others or to conceal low ability"; they also found that

[1]Finding of the National Commission on Responsibilities for Financing Postsecondary Education reported in "Making College Affordable Again," February 1993, (p.17).

individuals recall verbal material better when they analyze it for meaning (deep processing) than when they focus only on its superficial features (shallow processing). Cognition, therefore, plays an important role in learning and applying new information among youth.

The acquisition of knowledge is just one aspect of cognitive mastery. Social cognitive theory considers (1) the acquisition of knowledge concerning an innovation and (2) the adoption of that innovation in practice as two separate processes (Bandura, 1986). The latter depends greatly upon the durability and availability of resources needed for its replication, the complexity of tasks and knowledge involved in it, and the diffusion strategies used for its institutionalization (Rogers, 1983). Cognitive mastery is best achieved when the knowledge acquired is used in socially-meaningful ways and the innovation involved is widely replicated.

In a related study, Pintrich and DeGroot (1990, 38) concluded that "students who were more cognitively engaged in trying to learn by memorizing, organizing, and transforming classroom material through the use of rehearsal, elaboration, and organizational cognitive strategies performed better than students who tended not to use these strategies." They also found self-regulation to be highly correlated with cognitive strategy use. These findings further clarify the importance of cognitive mastery and of how it interacts with intrinsic motivation at the individual level.

Motivation and Affect

> Cognitive models of social behavior must reckon with the powerful force that affect can play in channeling social behavior.[2]

Similarly, Cleary (1991) concluded that the interaction of emotion and task performance affects significantly student outcomes in writing courses. Likewise, Meece, Hoyle, and Blumenfeld (1988, 522) found that "cognitive mediation models of motivation that emphasize the active role of learners in interpreting the demands of the learning situation according to their set of needs, values, and perceived abilities." Wentzel (1989) also concluded that "although primarily correlational and descriptive in nature..., an interactionist perspective is indeed valuable for understanding individual differences in adolescent classroom achievement." Taken together, these findings make a compelling case for the important role that motivation and affect have in the learning outcomes of young people and for their interplay with cognition in shaping those outcomes.

Among the questions that early awareness strategies could help address are: (1) how cognition and motivation interact?, and (2) which phenomenon proceeds the other? Even as early as 1970, Maslow (1970, 50) seems to struggle with these issues when in his formulation of a hierarchy of needs theory concluded that:

---

[2]David G. and Louise C. Peny (1987) discuss K.A. Dodge's five-step model of social information processing and the role of cognition in social behavior. However, they argue that large gaps exist in knowledge of such processing.

> ...the gratification of the cognitive impulses is subjectively satisfying and yields end-experiences. Though this aspect of insight and understanding has been neglected in favor of achieved results, learning, etc., it nevertheless remains true that insight is usually a bright, happy, emotional spot in any person's life.

Thus, motivation and affect interact with cognition in channeling student behavior, including the acquisition of knowledge and its application to career exploration and planning.

Policy Perspectives

Postsecondary training and its financing are largely shaped by federal and state policies. In general, the federal government provides over 74 percent of the student financial assistance and a large portion of funds for sponsored research and other higher education programs. States, including Michigan, provide about one-third of the operational budgets for public colleges and universities and significant amounts for student financial aid and other incentives which also benefit nonpublic institutions. College and universities also contribute, on average, approximately 20 percent (The College Board, 1992-93) for student financial assistance and funds for other support services, but the bulk of the funds and the policies they drive come from federal and state sources.

Postsecondary training for the past 30-40 years has been primarily viewed as a privilege which historically benefitted fewer than half the high-school population. In the 1980s and the early part of the 1990s, however, education beyond high school has been increasingly deemed a prerequisite to succeed in the labor market. It is now projected, for instance, that over two-thirds of all the new jobs to be created by the turn of the next century will require at least two years of postsecondary training and that more than half of those jobs will actually demand four or more years of college education. From the stand point of employment policy, postsecondary training is now considered not a privilege for the few, but a prerequisite for gainful employment and productive citizenship.

Job Outlook

Between 1990 and 2005, nationwide, the occupational groups projected to increase the fastest require postsecondary education, often beyond undergraduate training. Kutscher (1992) reports the following for various occupational groups:

Table 1 Projected Percent Change in the Employment Growth of Select Occupational Groups: 1990-2005

Occupational Groups	Percent Change
Mathematical and Computer Scientists	73
Personal Service	44
Health Assessment and Treating Occupations	44
Health Service	43
Health Technologist and Technicians	41
Lawyers and Judges	34
Protective Service	32
Mail and Message Distributing	15
Computer Equipment Operators	13
Handling, Equipment Cleaners, Helpers, Laborers	8
Farming, Forestry and Fishing	5
Financial Records Processing	-4
Machine Operators, Assemblers, and Inspectors	-9
Private Household Workers	-29

The preceding table shows a national trend towards a shrinkage of employment opportunities in low-skill and unskilled occupations, but the opposite in those requiring high-level skills and postsecondary training.

In Michigan, a similar pattern is evolving as documented by Table 2, below:

Table 2 Employment Projections of Select Occupations in Michigan: 1988-2000

Occupational Title	Actual 1988	Forecast 2000	Percent Change
Engineers, Architects and Surveyors	4,850	5,650	16
Computer and Mathematical Occs.	37,500	51,820	38
Law and Related Occs.	23,000	30,450	32
Teachers, Librarians, and Counselors	185,000	205,550	11
Health Practitioners, Technicians	176,600	223,750	27
Protective Services	80,650	98,300	22
Agriculture, Forestry, Fishing	110,750	102,750	-7
Blue-Collar Worker Supervisors	62,850	63,600	1
Construction Trades, Extractive	122,950	127,000	3
Hand Working Occ., Assemblers	132,350	112,150	-15

Source: Michigan Employment Security Commission, Detroit, Michigan, February 1992.

College Attendance Costs and Aid

Despite providing the largest share of student financial aid, the federal government's portion of the student aid budget has continuously declined from 83 percent in the early 1980s to 74 percent in the 1991-92 school year. Although states and institutions have increased their share of those funds during the same period from 5 to 6 percent and from 12 to 20 percent, respectively, financial aid has not kept pace with the increases in college attendance costs or even with those in the consumer price index (The College Board, September 1992). The national trend over the past decade has been, on the one hand, rapidly increasing college attendance costs and, on the other, constant dollar reductions in available student aid; further, during the same period of time, federal assistance shifted dramatically from grants and scholarships to loans and work-study programs.

The effects of federal and, to a lesser extent, state policies concerning student financial aid and funding of postsecondary education institutions include a rapidly-growing unmet financial need which in 1990-91 reached $2,287 per undergraduate student in Michigan; this amount represents almost a quarter, 24.2 percent, of the average total college attendance costs of $9,450. "Unmet need" is the portion of aggregate student financial aid need computed for all Michigan undergraduates that was not funded with available financial aid resources; this portion includes any loan or employment funds that were offered to students but were declined. Unmet financial need has become a major barrier for needy students to seek a postsecondary education.

Early Awareness

Although for many years empirical evidence has shown the value of early interventions, like Head Start for pre-school children at-risk, until recently, no systematic policy initiatives have been taken concerning early awareness about postsecondary education and student financial aid opportunities and prerequisites. The Higher Education Act of 1965, as amended in 1992, for the first time includes a National Early Intervention Scholarship and Partnership Program (NEISP) under Chapter 2, Subpart 2, Part A, of Title IV. South Carolina and some other states are already developing or implementing similar initiatives. The lack of policy and research experience on the specific issues surrounding early awareness makes the need for Project Awareness even more compelling for Michigan.

Strategies to Be Pilot-Tested

Project Awareness in Michigan consists of five intervention "strategies." Each represents a distinct medium for transmitting early intervention messages to students and to their parents. The five strategies are: Curriculum Guides, TV Videos, Database on Financial Aid Resources, Career Clubs, and Newsletters. The 15 project schools were asked to pilot-test two or more of the strategies. All of the strategies were designed to be as non-intrusive as possible.

Curriculum Guides

Curriculum Guides is one of the most widely requested strategies. It is the most complex to develop and implement, but holds promise of utility for all of the other strategies. This strategy will develop and supply supplementary curriculum guides to target schools for infusion into their required courses, i.e., language arts, mathematics, and social studies.

An interdisciplinary team of experts was contracted to develop the curriculum guides and materials between 1992 and 1993. The team included a teacher for each subject area, a curriculum development specialist, a school counselor, a postsecondary admissions counselor, and a financial aid administrator. In addition, curriculum specialists from the Michigan Department of Education were engaged in an advisory capacity. The guides are being developed in a way that parents and educators are also directly impacted by their content and infused in a manner compatible with student learning outcomes and required curricular objectives. For example, in language arts, students may be directed to write an admissions essay, or, to write a letter to a school requesting information on student financial aid; in math, students may be asked to solve story problems involving postsecondary costs and family budget; in social studies, students may explore the need for postsecondary education in light of future career opportunities, the economy, and the nation's work force.

TV Videos

The award-winning television production studio at Dearborn High School was selected and is now engaged in the development and production of as many as six 10-minute TV videos on student financial aid and postsecondary education opportunities. These videos will be developed and produced by some of the best students, some of whom have attended the Steven Spielberg school of film-making in Hollywood, under the technical direction of professional staff.

Database on Financial Aid Resources

A database on financial aid resources is already under development for statewide use, but is targeted for high school and postsecondary students. As a Project Awareness strategy, it will be modified for middle school students and educators to interact with a computerized system and be able to also obtain information on the process and requirements for seeking student financial assistance. The software which will be introduce in the fall of 1993 will be the "Fund Finder," a microcomputer-based database released by the College Board. The long-term aim is to develop a new database for Michigan with a variety of data from national, regional, state, local, and institutional programs.

Career Clubs

Career Clubs as a strategy is designed primarily as a partnership program. Project schools will be paired with neighboring colleges/universities in a mentoring relationship. College students will mentor three or four middle-school students each time they meet. The students will be motivated and informed about career opportunities, postsecondary education and student financial aid. This strategy will require the pre- and in-service training of college students selected for this activity. A monitoring system to continuously gauge its implementation is also required. One potential activity is to provide the middle school students with fun workbooks/journals that they can complete with their mentors. The content of the material to be used will be largely based on the curriculum guides being developed. The Campus Compact network in Michigan is being approached for participation and assistance in carrying out this strategy.

Newsletters

Newsletters as a strategy will be offered in two forms. First, feature stories and articles embodying Project Awareness topics will be provided in a camera-ready format to the project schools. They can use this material to insert in their own school's newsletter. Second, schools will be provided with a project newsletter to duplicate and disseminate to their students and parents. This latter option may consist of a camera-ready copy with the schools' letterhead and specific staff information but, otherwise, generic for all schools which may need one. As much as possible, articles which feature current and former students will be used (with photographs) to focus on the project communities. To enhance parental involvement, articles and "coupons for prizes" will be targeted to parents. Students may identify with a regular comic strip series that is fun as well as informative.

All strategies, with the exception of newsletters, will be introduced at the start of school, in the fall of 1993. An introductory edition of the newsletter will be distributed in the spring of 1993.

Table 3 Strategies Selected by Project Schools

School	Database	Curriculum	Video	Newsletter	Career Clubs
Capac	X	X	X	X	
Chesaning	X	X	X	X	X
Gerish	X		X	X	
Hutchins	X	X	X	X	X
Laingsburg	X	X	X	X	
McMichael	X	X			X
Montabella	X	X	X	X	X
Munger	X	X	X	X	X
Rockford	X	X	X	X	
Springfield		X	X	X	X
Summerfield		X	X	X	
Vicksburg	X	X	X	X	X
Western	X	X	X	X	X
Whitehall	X	X	X	X	X
Woodrow Wilson	X	X	X	X	X

Research Challenges and Opportunities

Garner and Raudenbush (1991, 260-1), in their review of the research method and strategy for the study of individual, school, and neighborhood measures as independent variables for general attainment in secondary school, found that "local deprivation and neighborhood effects have an important association with educational outcomes...[Although], traditionally, researchers have conceived of attainment as being determined mainly by individual and family background and the effect of school..., the effect of neighborhood must also be taken into account...[T]he sources of educational disadvantage are not singular: They are multivariate and multilevel." It follows that a hierarchical linear model, or a variant thereof, may be suitable for the study of early awareness as a dependent variable associated with individual, family, school, and community or neighborhood factors.

The research and evaluation challenges involved in Project Awareness include the limited organizational research experience on the part of the Michigan Higher Education Assistance Authority, the sponsoring entity, in dealing with research-based policy development; the resource requirements to develop, pilot-test, and evaluate new and complex strategies which involve large numbers of subjects on a longitudinal basis; the constraints of professional resources to design and conduct the formative and summative evaluation plan; the newness of the project as a research initiative to the sponsoring entity and many of the organizations represented on the Project Awareness Task Force; and the paucity of research work done, or underway, on specifically early awareness about postsecondary education and student financial aid opportunities and prerequisites. These are among the challenges faced by project staff in carrying out a sound research and evaluation plan.

Although challenges abound, so do research opportunities, too. For example, the project offers a chance to conduct a longitudinal study which can shed some new light on some of the substantive questions about the role of cognition and motivation, as well as their interaction, in channeling student behavior; to assess the relative cost-effectiveness of different early awareness strategies, and combinations of them, in different school and community settings; and to make a contribution, however minor, to the knowledge base of educational research and practice. These opportunities, among others, are sufficient to provide a balance for the many challenges involved in Project Awareness.

EVALUATION AND DATA ANALYSES

Measurement and Evaluation Considerations

The research reported here derives out of the evaluation program of Project Awareness. The project is being piloted in 15 middle schools, which were selected by means of a stratified random sampling from all "in-formula"[3] districts. For administrative convenience, all middle schools in the upper peninsula of Michigan, which would otherwise qualify, were excluded from participation. A second group of 15 middle schools, to act as the control group, were similarly selected.

The data obtained for this study are from a pupil questionnaire, a copy of which is attached in the Appendix. The questions either employ a Likert scale, or, except for "demographic" or individual identitive items, such as age, grade, and sex, request one correct response from among several foils. As will be described in the next section, for analytic purposes most items were reduced to dichotomies. This is the most elementary level of a nominal scale.

Because measurements are, for the most part, nominally scaled, loglinear analysis is used (Haberman, 1978; Bishop, Fienberg, & Holland, 1975). Loglinear "...models are useful for uncovering the potentially complex relationships among variables in a multiway cross tabulation. Loglinear models are similar to multiple regression models. In loglinear models, all variables that are used for classification are independent variables, and the dependent variable is the number of cases in a cell of the cross tabulation." (Norušis, 1992, p.146)

There are three types of loglinear models. These are 1) saturated loglinear model, 2) the independence model, and 3) hierarchical loglinear models. In a hierarchical model, if a term exists for the interaction of a set of variables, there must be lower-order terms for all possible combinations of these variables. In the present analysis variables exist for the identification of the student's school and grade, and there are variables indicative of student perceptions, attitudes and knowledge. The "higher order" variables are the school and the grade, for these apply to large groups of students, that is, large groups of students share the same school identification and the same grade. Student knowledge, on the other hand, varies from student to student, and is, therefore, a "low level" indicator. A hierarchical model is expressed in the form of "terms," with each term stating relationship among different order variables. An example of such a term is:

SCHOOL*GRADE*KNOWLEDGE

---

[3] "In-formula" refers to the per-pupil state aid formula used in Michigan. Districts whose mean property assessment value per pupil is lower than the state mean is said to be "in-formula." Districts whose assessment value per pupil is higher than the state mean are said to be "out-of-formula."

The asterisks indicate that the variable to the left is statistically independent with values common to large groupings of values of the variable to the right of the asterisk. Variables to the left are of hierarchically higher to the variables on the right. Lower order terms to the model stated above are:

SCHOOL*KNOWLEDGE
GRADE*KNOWLEDGE
SCHOOL*GRADE

Hierarchical loglinear models are used in this analysis.

To obtain a linear model, the natural logs of the cell frequencies, rather than the actual counts, are used. Thus, the following formula represents the log of the observed frequency in the i^{th} row and j^{th} column:

$$F_{ij} = \mu + \lambda_i + \lambda_j + \lambda_{ij}$$

where F_{ij} is the observed frequency in the cell, λ_i is the effect of i^{th} category, λ_j is the effect of the j^{th} category, and λ_{ij} is the interaction effect of the i^{th} value and the j^{th} value. The test of the hypothesis that a particular model fits the observed data is based on the likelihood-ratio chi-square, which is calculated as:

$$L^2 = 2\Sigma\Sigma F_{ij} ln F_{ij}/F_{ij}$$

Data and Preliminary Analyses

The data to be analyzed for the evaluation of Project Awareness will be chiefly derived from questionnaires administered to every pupil in the 15 project schools, and to their parents or other adult caretaker, and to the teachers in their building. These surveys are to be administered annually, in the spring, for the next five years. The 15 project schools enroll approximately 8,000 students. Potentially, an almost equal number of surveys should be returned for the parents. Of course it is likely to be far fewer. And the number of teachers is approximately 300. Thus, it is anticipated that between 10,000 to 12,000 surveys will be returned from the project schools. An approximately equal number of questionnaires will be distributed to the 15 control schools. In sum, data will derive from a total of potentially 24,000 questionnaires annually.

A baseline survey, prior to the advent of Project Awareness, is scheduled to be administered this spring. At this time the only data available for analysis are the data derived from the pilot administration of the student instrument in two schools. One rural middle school in northwestern Michigan and one urban school in southeastern Michigan were chosen. A total of 142 students in grades 6, 7 and 8, in both schools participated in the pilot administration. These data will here be used to demonstrate the utility and appropriateness of hierarchical loglinear analysis.

In addition to the dependent variables relating to scholastic performance, knowledge about postsecondary school, and about postsecondary student assistance, the questionnaire also has items about the student's home environment, about their scholastic and career aspirations, about their self-evaluation, and about their "locus of control." The final questionnaire will have an item which identifies the school in which it was administered. Information about the school was retained in the analysis of the pilot data. The questionnaire also provides for each student to identify her or his grade.

The variables submitted to hierarchical loglinear analysis are:

SITE	The school building of the respondent
GRADE	The grade of respondent, with values 6, 7, or 8
KAPSFA	Knowledge of postsecondary student financial assistance
POSTSEC	Knowledge about postsecondary schools
SAFETY	Student feeling of safety at school
SELFEVAL	Student self evaluation
LOCUS	Student belief of locus of control

The operant analytical or null hypothesis is:

There is no hierarchical ordering of the variables, thus, the students' school makes no independent contribution across grades.

Operationalization of the Analytic Variables

SITE and GRADE are both simple indicators. The site designation was retained by the researcher for each of the two subfiles which constitute the analytic file. Grade is indicated by each responding student in the last question, Question 36, of the questionnaire.

Knowledge about postsecondary student financial assistance (KAPSFA), derives from five items on the questionnaire. Question 18 reads:

When people talk about school after high school graduation, they are talking about: (CHOOSE AS MANY AS ARE CORRECT):

A. Alternative High School	B. College
C. GED	D. Vocational School
E. Community College	F. High School Intramural

The student would have had to have selected B, D, and E. Question 19 reads:

Community colleges, colleges, or universities in Michigan (MARK ONE):

1. Are free to all who attend
2. Charge tuition to all who attend
3. Don't know

The student would have had to have selected 2. Question 20 reads:

To get into a [sic] education or school after high school, a boy or girl must have: (CHOOSE AS MANY AS ARE CORRECT)

A. Lots of Money
B. Good test scores
C. High school diploma
D. Athletic skills
E. Little Money

The student would have had to select both B and C. Question 21 reads:

Student financial aid is: (CHOOSE ONLY ONE)

1. The money that parents receive from the government to pay for their home mortgage
2. The money that students receive to pay their way to college
3. The tutor that students get to improve their grades in classes
4. None of the above
5. All of the above

The student would have had to select 2. Finally, Question 24 reads:

Most student financial assistance is given on the basis of:

1. High Grades
2. Athletic ability
3. Family connections
4. The type of high school of the student
5. The financial need of the student

The student would have had to select 5.

The dichotomous indicator KAPSFA, Knowledge About Postsecondary Student Financial Assistance, derives from the preceding five questions. If all of the indicated correct responses are given, KAPSFA is true, 1. Otherwise KAPSFA is false, 0.

POSTSEC, knowledge about postsecondary schools, is a component of KAPSFA. It is also dichotomous. If the indicated correct response to Question 18, described above, is given, POSTSEC is true, 1. Otherwise POSTSEC equals 0.

The indicator SAFETY, derives from Question 4, K of the questionnaire. It reads: "I don't feel safe at this school." The response is given on a Likert scale. If the students answers "Strongly Agree" or "Agree", SAFETY is untrue, or 0. If the student responded "Disagree" or "Strongly Disagree," SAFETY is coded 1.

The dichotomous indicator SELFEVAL derives from Question 1, H, which reads: "On the whole, I am satisfied with myself." The response is given on a Likert scale. If the student answers "Strongly Agree" or "Agree", SELFEVAL is set to 1. If the response is "Disagree" or "Strongly Disagree," SELFEVAL is set to zero, 0.

The dichotomous indicator LOCUS, referring to the student's sense if locus of control, derives from Question 1, B, which reads: "I don't have enough control over the direction my life is taking." If the student chooses "Strongly Agree" or "Agree," LOCUS is set to zero, 0. If the student chooses "Strongly Disagree" or "Disagree," LOCUS is set to 1.

Thus defined, the above five indicators were subjected to hierarchical loglinear analysis, using the SPSS program HILOGLINEAR, using backward elimination with the retention criterion of a significance level not less than .05. In backward elimination, all terms which logically derive from the original model are generated. The resulting model is then tested with the likelihood ratio chi square, to determine if it exceeds the retention criterion. If the retention criterion is a probability greater than or equal to .05, which it is for the analysis reported here, then any model with a likelihood ration chi square value corresponding to a probability equal to, or greater than, .05 given the degrees of freedom of the model is rejected. Terms are then eliminated until the criterion level is satisfied. The following four hierarchical models were subjected to hierarchical loglinear analysis:

1) SITE*GRADE*POSTSEC*KAPSFA

The final, adjusted, model selected by the procedure, after five steps, is:

A) SITE*GRADE*POSTSEC
B) SITE*GRADE*KAPSFA
C) SITE*POSTSEC*KAPSFA
D) GRADE*POSTSEC*KAPSFA

The resulting likelihood ratio chi square is 12.99, with df = 9, p = .163.

2) SITE*GRADE*KAPSFA*SAFETY

The final, adjusted, model selected by the procedure, after five steps, is:

A) SITE*GRADE*KAPSFA
B) SITE*GRADE*SAFETY

The resulting likelihood ratio chi square is 4.07, with df = 6, p = .668.

3) SITE*GRADE*KAPSFA*SELFEVAL*LOCUS

The final, adjusted, model selected by the procedure, after 10 steps, is:

A) SITE*LOCUS*GRADE*KAPSFA
B) SITE*SELFEVAL*GRADE
C) SITE*SELFEVAL*LOCUS
D) SELFEVAL*KAPSFA

The resulting likelihood ratio chi square is 1.95, with df = 15, p = 1.0.

4) SITE*GRADE*SAFETY*SELFEVAL*LOCUS

The final, adjusted, model selected by the procedure, after 10 steps, is:

A) SITE*SELFEVAL*SAFETY
B) SITE*GRADE*SAFETY
C) SITE*SELFEVAL*LOCUS
D) SITE*SELFEVAL*GRADE
E) SELFEVAL*LOCUS*GRADE
F) LOCUS*GRADE*SAFETY

The resulting likelihood ratio chi square is 2.84, with df = 17, p = 1.0

Interpretation of the Findings

The fact that SITE, school building, was retained in the first position of all final models, and in every line in which it was retained as a factor, indicates that the school building, has an independent effect, deriving from a separate and more general level. Second, GRADE, which is in the second position of all final model statements with respect to knowledge about financial assistance, about postsecondary schools, and about safety, contributes an independent effect with respect to those variables, and seems to emanate from a general level within or below the school building. In models three and four, the variables self evaluation and locus of control were

entered. The final models, including these terms, placed them at a more basic level than grade. Locus of control in particular is also more basic to sense of safety and to knowledge of postsecondary student financial assistance.

In conclusion, hierarchical loglinear analysis has demonstrated its usefulness in analyzing multilevel action arenas, such as the performance and orientation of students in grades and in buildings. The findings also indicate that while the physical, contextual elements, specifically the different buildings and grades, each of which includes a number of students has a hierarchically high relation to student knowledge, basic student orientations, including their sense of the locus of their control and their basic self evaluation seem to contribute an hierarchically distinct effect to at least some contextual factors.

These models, as well as others, will be tested with the full set of data derivative of the baseline survey. Conclusions about models and appropriate analytic procedures should wait at least until then. □

REFERENCES

Bandura, A. Social Foundations of Thought and Action. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1986.

Bishop, Y. M. M., S. E. Fienberg, and P. W. Holland Discrete Multivariate Analysis: Theory and Practice, Cambridge, Mass.: MIT Press, 1975.

Byrne, S. M., Constant, A., and Moore, G. "Making Transitions from School to Work." Educational Leadership, March 1992: 23-26.

Cleary, L. M. "Affect and Cognition in the Writing Process of Eleventh Graders." Written Communication, Vol. 8, No. 4, October 1991: 473-507.

Garner, C. L. and Raudenbush, S. W. "Neighborhood Effects on Educational Attainment: A Multilevel Analysis." Sociology of Education, Vol. 64 (October), 1991: 251-262.

Gauhier, L. R. "Helping Middle School Students Develop Language Facility." Journal of Reading, January 1990: 274-276.

Gorrell, J. and Trentham, L. "Teachers' Preferred Modes of Helping Students." Journal of Research and Development in Education, Vol. 25, No. 3, Spring 1992: 142-148.

Graham, S. and Golan, S. "Motivation Influences on Cognition: Task Development, Ego Involvement, and Depth of Information Processing." Journal of Educational Psychology, Vol. 83, No. 2, 1991: 187-194.

Haberman, S. J. Analysis of Qualitative Data, Vol. 1 New York: Academic Press, 1978

Kozma, R. B. and Croninger, R. G. :"Technology and the Fate of At-Risk Students." Education and Urban Society, Vol. 24, No. 4, August 1992: 440-453

Markova, A. K. "A Strategy for Forming Learning Motivation." Prospects, Vol. XX, No. 3, 1990.

Meece, J. L., Hoyle, R. H., and Blumenfeld, P. C. "Students' goal Orientations and Cognitive Engagement in Classroom Activities." Journal of Educational Psychology, Vol. 80, No. 4, 1988: 514-523.

Mitchell, J. V., Jr. "Interrelationships and Predictive Efficacy for Indices of Intrinsic, Extrinsic, and Self-Assessed Motivation for Learning. "Journal of Research and Development in Education, Vol. 25, No. 3, Spring 1992:149-155.

Moniuszko, L. K. "Motivation: Reaching reluctant readers age 14-17." Journal of Reading, Vol. 36, No. 1, September 1992: 32-34.

Moslow, A. Motivation and Personality (2nd Ed.). New York: Harper & Row, 1970.

National Commission on Responsibilities for Financing Postsecondary Education. "Making College Affordable Again." Washington, D.C.: February 1993.

Norušis, M. J. "Hierarchical Loglinear Models," in SPSS for Windows Advanced Statistics, Release 5, SPSS, Inc, 1992: 145-170

Offer, D. Et al. The Teenage World. New York: Plenum Medical Book Company, 1988.

Perry, D. G. and Perry, L. C. "Applications of Dodge's Social Information Processing Model of Social Competence of the Study of Prosocial Behavior in Children." ERIC ED 289621, July 1987.

Pintrich, P. R. and DeGroot, E. V. "Motivational and Self-Regulated Learning Components of Classroom Academic Performance." Journal of Educational Psychology, Vol. 82, No. 1, 1991: 33-40

Rogers, C.R. Diffusion of Innovations (3rd edition). New York: Free Press, 1983

Wentzel, K. R. "Adolescent Classroom Goals, Standards for Performance and Academic Achievement: An Interactionist Perspective." Journal of Educational Psychology, Vol. 81, No. 2, 1989: 131-142.

VanDevender, E. M. "Involving Parents: How and Why." Academic Therapy, May 1988: 523-528.

APPENDIX

Student Questionnaire